

# EXHIBIT A

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA  
SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.,

Plaintiff,

v.

Case No. CV 10-03561 WHA

GOOGLE, INC.,

Defendant.

EXPERT REPORT OF DR. ALAN J. COX

Revised October 21, 2011

**HIGHLY CONFIDENTIAL  
SUBJECT TO PROTECTIVE ORDER**

## 2. Apportionment of Google's Allegedly Wrongful Profits Attributable to Copyright Infringement

### a. Introduction

To recap: in the penultimate and earlier sections, I have accounted for appropriate costs to deduct from Google's total revenues earned from the entire Android platform in order to calculate its profits to date. Google's allegedly wrongful profits attributable to the purported copyright infringement through September 2011 are zero on the basis of these calculations. In earlier sections, I also addressed the possibility that it is found that some of the indirect operating expenses should not be deducted for purposes of calculating allegedly wrongful profits on the entire Android platform, resulting in positive profits. (From an economic point of view, however, it would be appropriate to deduct all the costs that I deduct from revenue.) I have determined that any resulting profit associated with the entire Android platform is due to factors other than the API claim. The ready availability of obviously acceptable non-infringing alternatives also provide basis that the "element of profit" that is attributable to the allegedly infringed API claim contained in the Android framework is very small or zero. This is consistent with actual events since it explains why Google was unwilling to enter into a license agreement with Sun. It also explains why the choice of programming language was difficult.

However, even if, for the sake of argument only, there were some basis for awarding wrongful profits, Dr. Cockburn's estimate of damages is an unreliable indicator of the appropriate remedy. This is the case even if Dr. Shugan's results can be relied upon. In the remainder of this section I will correct Dr. Cockburn's estimate of allegedly wrongful profits, accepting, for the sake of argument, Dr. Shugan's estimate of incremental market shares that results from the 37 API packages. Since profits are derived from generating revenue, I first calculate the range of alleged increase in revenue that result from Dr. Cockburn claimed impact of the 37 API packages. From that I calculate the incremental profits that Google allegedly received unfairly as a result of the 37 API packages.<sup>130</sup>

---

<sup>130</sup> Dr. Cockburn does the calculations I talk about in this section on the basis of net revenue after deducting TAC. Since percentage results do not change whether we are doing this after or before deducting TAC, I ignore this distinction for the purpose of calculating percentages.

### **b. Calculation of the Increase in Allegedly Wrongful Revenues**

As a first step to calculating alleged wrongful profits, I estimate the increase in net advertising revenues that Dr. Cockburn estimates as the basis for the value attributable to the 37 API packages. Dr. Shugan provided Dr. Cockburn with a range of possible increases in market share that Dr. Cockburn claims resulted from the use of the 37 API packages. Dr. Cockburn estimated the impact of the increased number of applications that he claims were available as a result of allegedly infringing the 37 API packages. According to Dr. Cockburn's report, Dr. Shugan worked under Dr. Cockburn's direction.<sup>131</sup> Dr. Shugan confirmed this at his deposition, testifying that Dr. Cockburn had input into the range of the number of applications to use in his survey.<sup>132</sup> Normal practice in doing a survey would be to use a range that tended to symmetrically bracket the most reasonable value.<sup>133</sup> In reporting results, good research would tend to use results across the entire range of possible values tested, not just the extreme end. Without providing any explanation, Dr. Cockburn picked the highest change in market share resulting from a change in the number of applications available, a decrease of 19.2 percent. The 19.2 percent decrease is mathematically converted into what he characterizes as an "increase in value" in the Android platform. This percentage of 16.9 percent<sup>134</sup> is actually, as I have already explained in relation to Figure 1, the sales that he attributes to the 37 API packages. It is the "Percent Contribution of Additional Applications to Google's Incremental Mobile Advertising Net Revenues." The percentage is the ratio of the top-most layer of the right-hand column of Figure 1 to the sum of the top two layers of that column.

I first correct for the bias of using just one extreme value by averaging with the result of using the other end of the range of Dr. Cockburn's and Dr. Shugan's result. That is, I investigated the imputed value of the net advertising revenue increase if I used the other value

<sup>131</sup> Cockburn Report, ¶ 472.

<sup>132</sup> Shugan Deposition, Rough Transcript, P. 95, ll. 3- 8

<sup>133</sup> By this I mean that a researcher would use the likely true value of the variable of interest (in this case, the number of apps as the mid-point of the values to be tested). For instance, if you wanted to find out how survey subjects would respond to an increase BART fares to the airport from \$10 to \$11 dollars, an appropriate set of questions might involve a range of price changes within the interval of \$7 to \$14. A reasonable forecast of the response to such a price increase might be made on the basis of responses of different sized changes across the entire range, with possible weighting towards the middle of the range. Good research practice would generally not rely solely on the impact of a price increase from \$16 to \$20 to determine the impact of the price increase from \$10. .

<sup>134</sup> Cockburn Report, Exhibit 26, "Percent Contribution of Additional Applications to Google's Incremental Mobile Advertising Net Revenues,"

that Dr. Shugan reported to Dr. Cockburn for the purpose of averaging. To do this, I take the results directly from Dr. Shugan's Exhibit 3a, which reports a loss in market share of 7.9 percent due to a smaller decrease in the number of applications available than in the scenario which results in the 19.2 percent loss reported in Dr. Shugan's Exhibit 4a. Had Dr. Cockburn undertaken the same analysis with the 7.9 percent figure as he had with the 19.2 percent figure, Dr. Cockburn would have reported a "Percentage Contribution of Additional Applications to Google's Incremental Mobile Advertising Net Revenues" of 6.1 percent. Thus, according to the results provided by Drs. Shugan and Cockburn, the range of possible declines in Google's incremental advertising revenue resulting from the introduction of the Android platform without practicing the API claim, is 6.1 percent to 16.9 percent.

The results are summarized in the first four rows of Exhibit 3d. Row (a) shows the decline in market share that Dr. Shugan purported to measure as a result of the changes in application offerings. Row (b) shows the resulting decline in the "incremental value of Android" according to Dr. Cockburn. As I described above, this is actually the decline in net mobile advertising revenue that Google would allegedly suffer if it did not use the material covered by the Oracle API claim, the topmost layer in the right hand column of Exhibit 7. Row (c) shows Google's incremental net advertising revenue that Dr. Cockburn attributes to the introduction of the Android platform, which I also depicted as the sum of the top two layers of the right-hand column of Exhibit 7. It shows the range mentioned in the previous paragraph: 6.1 percent to 16.9 percent.

Row (d) shows the resulting decline in Google net mobile advertising revenues as a percentage of the \$298.9 million increment under Dr. Shugan's two scenarios. Row (f) shows Dr. Cockburn's estimate of all net advertising revenues through Android smartphones. It is the equivalent of the sum of the top three layers of the right-hand column of Exhibit 7. Row (g) is simply the revenue that Dr. Cockburn attributes to the use of the material covered by the Oracle API claim divided by Google's net advertising revenue through Android. Below that I show the average of the two numbers. I use this average of 8.1 percent for the purpose of my analysis of the incremental net advertising revenue allegedly wrongfully earned by Google as a result of using the 37 API packages.

**c. Calculating the Alleged Wrongful Profit Using Dr. Cockburn's Estimate of the "Value" of the Material Covered in Oracle's API Claim**

I now describe my preferred calculation of alleged wrongful profit from the purported misappropriation of the 37 API packages. As I have pointed out, Dr. Cockburn clearly sees the purported "value" of utilizing the 37 API packages as an increase in sales of handsets enabled with Android and a resulting increase in net advertising revenue for Google. I, therefore, calculate the economically appropriate alleged wrongful profit by first calculating the increase in net advertising revenues from Dr. Cockburn's estimates and then deducting any increase in costs that would result from that increase in revenues.

I first had to recreate the revenues and costs for each of the line items described for Exhibit 2a. I assumed that Dr. Cockburn's increase in revenues would have affected Nexus Phone Revenues and Android Market Revenues by the same proportion that Dr. Cockburn's results indicated for Gross Ad Revenues. In effect that means that, in the but-for situation, revenue from all three of those items would have been 91.9 percent (100 percent – 8.1 percent) of what they actually were. The results of these calculations are shown in column (1) of Exhibit 3a. It indicates that, using Dr. Cockburn's results, revenue from these three items would have been \$500.4 million, \$105.9 million and 28.8 million, respectively.

I also assume that TAC would have decreased proportionally to advertising revenues. The next item, Operations, consists primarily of network and server costs. Based on my experience, these costs are scalable to the amount of business that would have been done, a point confirmed in my discussion with Mr. Aditya Agarwal, Senior Financial Analyst at Google. I expect that this cost would also decline approximately proportionally to the decline in advertising revenues, mobile handsets, and items in the Android Market. For both these items, I assumed the same reduction to 91.9 percent. This is also shown in column (1) of Exhibit 3a.

COS (incl. DTC) would also be lower in the but-for world with lower sales. These costs include credit-card fees largely associated with sales in the Android Market and the costs of building and shipping Google's Nexus One mobile handsets. Both of these costs would drop proportionally to the decline in Nexus Phone and Android Market revenues. However, COS includes other costs that may not decline at all. Since I do not have a good understanding of how

much lower this cost would be in the but-for world, I make the conservative assumption that it will not be lower at all.

All of the other items are generally fixed and would not change proportionally with reduced sales and advertising revenues, if at all. For instance, engineering costs would likely be just as high in the but-for situation as the actual situation.<sup>135</sup> This also was confirmed in my conversation with Mr. Agarwal. These line items are also shown in column (1). The last item in the column shows the profits from the deployment of Android from 2008 through September of 2011. The bottom-line number for the sales that would have been made by Google appropriately applying Dr. Cockburn's own results, is a loss of \$65.1 million.

Having calculated the profits in the but-for world, I need to compare that to the profit and loss statements for the actual world, reproduced here in column (2). All differences are due to the difference in sales, calculated using Dr. Cockburn's results. The bottom line number for the actual world is a loss of \$25.5 million. This loss is \$39.6 million less than the loss incurred under the but-for scenario. Thus, \$39.6 million represents the allegedly unfair profits from using the 37 API packages.

This \$39.6 million change in profit is also demonstrated in columns (3) and (4). Column (3) shows the difference in costs between the actual and the but-for profit and loss statements. Column (4) shows the increase in revenues using the results reported in the Cockburn Report. It also shows how those revenues are offset by increases in costs, if any. For example, it shows the manner in which the \$55.8 million in increased revenue between the actual and the but-for world is offset by the \$16.3 million in increased cost of sales. The resulting increase in net revenue is \$39.6 million. From that, no increase in operations costs are deducted as I classify none of them as incremental.

## F. Oracle's Actual Lost Profits Damages

### 1. Overview

Dr. Cockburn calculates Oracle's actual lost profits damages based on two components: (1) Sun's lost Java ME licensing revenue and (2) Sun's lost profits derived from its Acadia

---

<sup>135</sup> I deduct the amortized version of engineering costs from revenues in this case. The choice of amortization method does not matter in this analysis since it will be the same in both cases.

**d. Dr. Cockburn Attributed All of the Difference Between Forecasted and Actual Revenue to the Competition from Android**

As discussed earlier, given that Java ME was largely dependent on feature phones, the shift away from feature phones toward smartphones accounted for at least part of the decrease in Java ME revenue, and Android smartphones represented only a portion of this shift because Android had only a portion of the worldwide smartphone market. In the “but-for” situation without Android, other smartphones such as the iPhone would have captured a sizable portion of the Android handset sales. Apple does not license Java ME from Oracle. Thus, these “lost revenues” would remain lost (Apple could capture them, not Oracle) even in the absence of Android. I have accounted for this factor in revising Dr. Cockburn’s lost profits damages estimate, attributing only part of the actual and predicted lost Java ME sales to Android.<sup>217</sup>

**e. Summary**

When I make all of the adjustments described above, Dr. Cockburn’s lost profits damage calculation decreases from \$118.3 million to \$24.3 million, for the period 2009-2011 for Java ME.<sup>218</sup> Furthermore, according to the results of Oracle’s own damages experts, only 13.45% of Android’s sales are attributable to the alleged copyright infringement.<sup>219</sup> Applying this apportionment percentage results in a revised Java ME lost profits damages estimate of \$3.3 million.<sup>220</sup>

As for Project Acadia, as stated above, it is my opinion that Dr. Cockburn’s calculation is speculative and one should not attribute the failure of Project Acadia to Android. However, for the sake of argument, if I were to attribute the failure of Project Acadia all to Android, take Dr. Cockburn’s damages estimate as given, and apportion it to the alleged copyright infringement, the revised Project Acadia lost profits damages estimate would be \$2.4 million.<sup>221</sup>

---

<sup>217</sup> Exhibit 4b.

<sup>218</sup> Exhibit 4a.

<sup>219</sup> 13.45% is calculated by taking the average of 19.0% and 7.9%, which are the losses of Android market share as estimated in the Shugan Report, Exhibits 3a and 4a, assuming the number of available applications falls from 100,000 to 6,000 and 40,000, respectively.

<sup>220</sup> Exhibit 4a.

<sup>221</sup> Cockburn Report, Exhibit 21. \$17.9 million times 13.45% equals \$2.4 million.

I note that even these figures likely overstates Oracle's lost profit damages. As I have discussed elsewhere, Google had non-infringing alternatives to the copyrights-in-suit. Under these non-infringing alternatives, Google still would have offered Android, contrary to Dr. Cockburn's assumption. In that case, there is no evidence that Oracle would have made any additional sales beyond the level it has actually made.

## **G. Oracle's Lost License Fee Damages**

### **1. Overview**

As an alternative measure of Oracle's actual damages, Professor Cockburn calculates "the lost fair market value license fee that Sun would have obtained but for the infringement."<sup>222</sup> Professor Cockburn calculates this lost license fee by modeling the outcome of a hypothetical negotiation between a willing licensor (Sun) and a willing licensee (Google) for a license to the material covered by the copyright claim. The outcome of this hypothetical negotiation is a "reasonable royalty," or lost license fee, that Google would have been willing to pay to Sun for use of the material covered by the copyright claim.

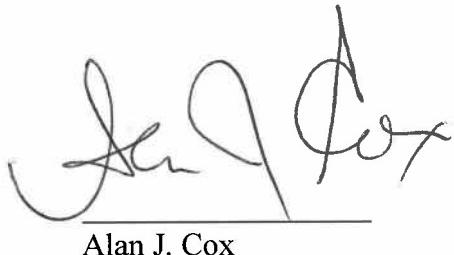
First, as I have already noted, Dr. Cockburn relies on no objective evidence that Oracle would ever have licensed Google to use the 37 API packages in the manner it did. To the contrary, Dr. Cockburn relies on evidence that Sun (now Oracle) was seeking to compete in the provision of operating systems for smartphones. An Oracle witness testified that, in his opinion, Android "sucked all the air out of the room for Java on smartphones,"<sup>223</sup> a fact that is independent of Google's use of the alleged copyright. In my opinion, it would be speculative to assume that Sun (now Oracle) would have licensed Google's competitive use of the APIs at issue, and thus speculative to conclude that Oracle was damaged by losing a license fee.

However, assuming there was a lost license fee, I disagree with .Cockburn's analysis of what that fee would have been. Professor Cockburn's determination of lost license fees for the copyright claim is based entirely on his analysis of the "hypothetical negotiation" between Sun and Google related to Google's alleged infringement of certain patents owned by Oracle. The only difference between Professor Cockburn's copyright infringement and patent infringement

<sup>222</sup> Cockburn Report, p. 189, ¶470.

<sup>223</sup> Screven Depo. at 71.

are considered, the lost license fee would be \$24.1 million, but if the analysis is restricted to sales of accused models only, the lost license fee would reduce to \$3.1 million.



The image shows a handwritten signature in black ink, appearing to read "Alan J. Cox". Below the signature is a thin horizontal line, and underneath that line is the typed name "Alan J. Cox".

Dated: October 3, 2011

(Revised October 21, 2011)

**Exhibit 2a**  
**Running Profit and Loss Statement of the Android Platform**  
**Assuming Expensing of Engineering Expenses**  
**January 2008 - September 2011**

Line Item	Total 2008 - 2011 (1)	Total Revenue After Subtracting Line Item (Millions of U.S. Dollars)			Apportioned by 15% <sup>3</sup> (4) (2) = (3) (3)*15%	Apportioned by 8.1% <sup>4</sup> (5) (3)*8.1%
<b>Revenue<sup>1</sup></b>						
Android Gross Ad Revenues	\$ 544.3					
Nexus Phone (DTC) Revenues	115.2					
Android Market Revenues	31.3					
<b>Total Revenue</b>	<b>\$ 690.8</b>					
prev(3) - (2)						
<b>Cost of Sales<sup>1</sup></b>						
TAC	\$ 180.6	\$ 510.2	\$ 76.5	\$ 41.2		
Operations	20.7	489.6	73.4	39.6		
COS (incl. DTC)	120.1	369.5	55.4	29.9		
<b>Selected Operating Expenses<sup>1</sup></b>						
Marketing	\$ 126.4	\$ 243.0	\$ 36.5	\$ 19.6		
Product Management ("PM")	11.0	232.1	34.8	18.7		
Sales Expenses	15.9	216.2	32.4	17.5		
Engineering Expenses	\$ 356.7	\$ (140.5)	\$ (21.1)	\$ (11.3)		
Purchase Price of Android <sup>2</sup>	\$ 10.89	\$ (151.3)	\$ (22.7)	\$ (12.2)		
Milestone Payments	60.00	(211.3)	(31.7)	(17.1)		

**Notes and Sources:**<sup>1</sup> See Exhibit 3b, column (5). All data are actual except September 2011 forecast.<sup>2</sup> Google agreed to purchase Android on June 30, 2005 (GOOGLE-00303922). Milestone payments totaled \$60 million, all of which were paid out (GOOGLE-00303922; GOOGLE-00303930 and interview with Aditya Agarwal).<sup>3</sup> Dr. Cockburn's copyright apportionment percentage is 15%, which appears to be based off his calculation of the "Percent Contribution of Additional Applications to Google's Incremental Mobile Advertising Net Revenues," or 16.9%, in Exhibit 27.<sup>4</sup> See Exhibit 3d.

**Exhibit 2b**  
**Running Profit and Loss Statement of the Android Platform**  
**Assuming Amortization of Engineering Expenses**  
**January 2008 - September 2011**

Line Item	Total 2008 - 2011 (1)	Total Revenue After Subtracting Line Item (Millions of U.S. Dollars)			Apportioned by 8.1% (5)) (3)*8.1%
		(3) (2) = (3)		Apportioned by 15% (4) (3)*15%	
<b>Revenue<sup>1</sup></b>					
Android Gross Ad Revenues	\$ 544.3				
Nexus Phone (DTC) Revenues	115.2				
Android Market Revenues	31.3				
<b>Total Revenue</b>	<b>\$ 690.8</b>		<b>\$ 690.8</b>		
prev(3) - (2)					
<b>Cost of Sales<sup>1</sup></b>					
TAC	\$ 180.6	\$ 510.2	\$ 76.5	\$ 41.2	
Operations	20.7	489.6	73.4	39.6	
COS (incl. DTC)	120.1	369.5	55.4	29.9	
<b>Selected Operating Expenses<sup>1</sup></b>					
Marketing	\$ 126.4	\$ 243.0	\$ 36.5	\$ 19.6	
Product Management ("PM")	11.0	232.1	34.8	18.7	
Sales Expenses	15.9	216.2	32.4	17.5	
Amortized Engineering Expenses	\$ 170.8	\$ 45.4	\$ 6.8	\$ 3.7	
Purchase Price of Android <sup>2</sup>	\$ 10.89	\$ 34.5	\$ 5.2	\$ 2.8	
Milestone Payments	60.00	(25.5)	(3.8)	(2.1)	

**Notes and Sources:**<sup>1</sup> See Exhibit 3b, column (5). All data are actual except September 2011 forecast.<sup>2</sup> Google agreed to purchase Android on June 30, 2005 (GOOGLE-00303922). Milestone payments totaled \$60 million, all of which were paid out (GOOGLE-00303922; GOOGLE-00303930 and interview with Aditya Agarwal).<sup>3</sup> Dr. Cockburn's copyright apportionment percentage is 15%, which appears to be based off his calculation of the "Percent Contribution of Additional Applications to Google's Incremental Mobile Advertising Net Revenues," or 16.9%, in Exhibit 27.<sup>4</sup> See Exhibit 3d.

**Exhibit 3a**  
**Allegedly Wrongful Profits Attributable to Copyright Infringement**  
**Assuming Amortization of Engineering Expenses**  
**January 2008 - September 2011**

<b>Line Item</b>	<b>Profit and Loss Without Infringement<sup>1</sup></b>	<b>Profit and Loss With Infringement<sup>2</sup></b>	<b>Incremental Change in Costs With Infringement</b>	<b>Profit After Subtracting Line Item</b>
	(1)	(2)	(3) (2) - (1)	(4) (2) - (1)
----- (Millions of U S. Dollars)-----				
<b>Revenue</b>				
Android Gross Ad Revenues	\$ 500.4	\$ 544.3		\$ 44.0
Nexus Phone (DTC) Revenues	105.9	115.2		9.3
Android Market Revenues	28.8	31.3		2.5
<b>Total Revenue</b>	<b>\$ 635.0</b>	<b>\$ 690.8</b>		<b>\$ 55.8</b>
prev(4) - (3)				
<b>Cost of Sales</b>				
TAC	\$ 166.0	\$ 180.6	\$ 14.6	\$ 41.2
Operations	19.0	20.7	1.7	39.6
COS (incl DTC)	120.1	120.1	-	39.6
<b>Selected Operating Expenses</b>				
Marketing	\$ 126.4	\$ 126.4	\$ -	\$ 39.6
Product Management ("PM")	11.0	11.0	-	39.6
Amortized Engineering Expenses	170.8	170.8	-	39.6
Sales Expenses	15.9	15.9	-	39.6
Purchase Price of Android <sup>3</sup>	\$ 10.9	\$ 10.9	\$ -	\$ 39.6
Milestone Payments	60.0	60.0	-	39.6
<b>Profit</b>	<b>\$ (65.1)</b>	<b>\$ (25.5)</b>		<b>\$ 39.6</b>

**Notes and Sources:**

<sup>1</sup> Total Revenue, TAC, and Operations in column (1) are reduced by 8.1% from column (2). 8.1% is the average of the calculations using Dr. Cockburn's assumptions and alternative assumptions to determine the estimate of the contribution of additional applications to Google's incremental mobile advertising net revenues as a percentage of Android advertising revenue (see Exhibit 3d). The remaining line items are equivalent to column (2).

<sup>2</sup> See Exhibit 3b, column (5). All data are actual except September forecast.

<sup>3</sup> Google agreed to purchase Android on June 30, 2005 (GOOGLE-00303922). Milestone payments totaled \$60 million, all of which were paid out (GOOGLE-00303922; GOOGLE-00303930 and interview with Aditya Agarwal).